

Waste to Hydrogen

California Hydrogen Highway Network SB76

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Waste to Hydrogen Rationale

1. Our organic waste stream represents a significant and largely untapped resource for the cost-efficient, socially-beneficial production of immense quantities of fuel-grade hydrogen.
2. Current 'mainstream' hydrogen production methods (reformation and electrolysis) either consume significant amounts of energy or result in significant efficiency loss.
3. Rather than landfilling, burning or warehousing our hydrogen-rich organic waste stream, we now have ready access to cost-competitive technologies to harvest this abundant resource and realize significant efficiencies.

Waste to Hydrogen production represents an opportunity to meet multiple, complimentary objectives

1. Production of sufficient quantities of renewably derived hydrogen to meet stated objectives of the California Hydrogen Highway Network Blueprint Plan.
2. Waste stream diversion and mitigation, providing measurable air, land and water improvements.
3. Low-cost, scalable distributed generation of hydrogen, positioned in proximity to centers of high organic waste stream production / high vehicle usage.
4. Distributed hydrogen availability, in quantities sufficient to create and support critical mass, as HICE vehicles begin mainstreaming.

Anaerobic Digestion and Ultrahigh Temperature Gasification (Pyrolysis / Hydrolysis)

Complimentary technologies that collectively address both the problems and the opportunities presented by our organic solid waste stream, enabling the production of immense quantities of fuel grade hydrogen.

Onsite Power Systems, Inc. - Anaerobic Digestion

1. Organic feedstock (food waste, green waste, etc.) can be converted into a hydrogen-rich biogas as well as a beneficial value-added byproduct.
2. The biomass feedstock can convert 60% to 90% of the organic solids to usable energy.
3. The biogas can be minimally processed to yield an energy value comparable to pipeline natural gas.
4. Advances in AD technology promoting optimal environmental conditions for the system's microorganisms result in significantly reduced retention time with an expedient and efficient conversion of the organic feedstock into a renewable transportation fuel.

ILS Partners / Pyromex

Ultrahigh Temperature Gasification (Pyrolysis - Hydrolysis)

1. Difficult to process, non-recyclable organic waste streams such as automobile shredder residue (ASR), tires, carpets, plastics, medical waste, palm fronds, nut shells, orchard thinnings, etc. can be utilized as a feedstock to produce a hydrogen-rich syngas (pyrogas), as well as a beneficial value-added byproduct.
2. The Pyromex technology exceeds all current environmental and emission standards, producing an inert, non-leaching, basalt-like residue from any inorganic content that is mixed in with the feedstock. No ash or tar residues are produced.
3. The Pyromex technology has been lauded by the European Community Energy, Environmental and Sustainable Development Program as the only suitable system available on the market today.

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